

# MOUNTAIN EXPLORATION.

BY

ERWIN SWIFT BALCH.

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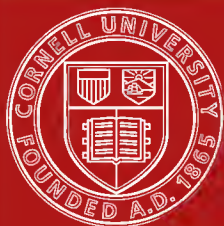
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Edwin F. Webb  
1856

# MOUNTAIN EXPLORATION

BY

EDWIN SWIFT BALCH

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D.Y.



A. 47731

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MOUNTAIN EXPLORATION\*

BY

EDWIN SWIFT BALCH

(A. B. Harvard University: Member of the Philadelphia Bar.)

*Read before the Geographical Club, December 9, 1892*

I.

The importance of mountaineering from a geographical point of view is hardly understood by people in general. Most persons look upon it purely in the light of a sport, and consider it, not unjustly, as a very dangerous sport. How much has been done by mountaineers from a geographic, a scientific or an artistic impulse is hardly known, nor is it scarcely ever considered what a field is still open for mountain exploration and observation. The following statements, from the sixth edition of Murray's "Handbook of Switzerland," published in 1854, voice well the old and still largely prevalent opinion of mountaineering: "The ascent of Mont Blanc is attempted by few; those who are impelled by curiosity alone are hardly

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justified in risking the lives of the guides. It is a somewhat remarkable fact that a large proportion of those who have made the ascent have been persons of unsound mind. Those who have succeeded have, for the most part, advised no one to attempt it." Of late years there has unfortunately developed a tendency among certain men to treat the Alps as greased poles. But the beginnings and the development of mountaineering were largely due to other causes, the same causes which have moved explorers all over the world: the desire to find out and map new regions, the desire to make scientific experiments, the study of the geology and the botany of the mountains, and in many cases the beauty and charm alone of the mountain landscapes.

The first point that suggests itself in considering mountaineering is to look at the field it opens to explorers: at the extent of mountain ranges all over the world. The mountain countries cover, I believe, something like one-sixth of the globe. The Alps, the Pyrenees, the Norwegian Ranges, the Caucasus, in Europe. The Himálayas, the Kuenlun, the Hindoo-Koosh, the Altai, the Japanese Mountains, and many other ranges, in Asia. The Atlas, the Drakensberg, Kilima-Njaro, Kenya, Ruwenzori, in Africa. The Rocky Mountains, the Sierra Nevada, the Mexican Volcanoes, the Alaskan Ranges, the Andes, in America. New Zealand and the Sandwich Islands, in the Pacific. Here is country covering a large area, of which much is still unexplored, and of which what is known is largely due to mountaineers.

To all snowy ranges, for purposes of geographical exploration, it is necessary to apply what we may call modern scientific mountaineering. To reach the big peaks, to cross the passes, to map out the glaciers, trained

climbers are needed, and even trained amateur climbers, when unassisted by professional guidance, have, in many cases, gone to distant countries and failed in accomplishing their explorations. Dr. Güssfeldt, for instance, one of the best known climbers in the Alps, tried to explore the Chilian Andes;<sup>1</sup> but, owing to his having only Chilian natives with him, was unable to accomplish his purpose or to reach Aconcagua. Seton-Karr,<sup>2</sup> Schwatka and several others have vainly tried to ascend Mount Saint Elias, and several expeditions have not, as yet, succeeded in unravelling the secret of the Alaskan Mountains, for we are not yet sure but that Mount Wrangell may not be the highest summit of North America. Kilima-Njaro, in Central Africa, resisted the attempts of several ordinary travellers, though they were men of nerve and pluck, such as Mr. H. H. Johnston,<sup>3</sup> and though not difficult, Kilima-Njaro<sup>4</sup> would not be conquered until an expert like Purtscheller came along.

It is hardly to be wondered at that the Alps were not explored during the Middle Ages. The mediæval burgher's idea in general was that they were pretty uncomfortable places. One old chronicler, Fleming, after casting about for some reason to explain the existence of mountains, had nothing to say about them, except that they were inhabited by the beasts. When Whymper<sup>5</sup> first came to the Val Tournanche, he found that the natives of that valley firmly believed that gins and effreets lived on the Matterhorn that on its summit was an invisible ruined city, where the Wandering Jew and the spirits of the damned met. 'The

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<sup>1</sup> P. Güssfeldt. *Reise in den Andes von Chili und Argentinien.*

<sup>2</sup> H. W. Seton-Karr. *The Alpine Regions of Alaska. Proceedings of the Royal Geographical Society.* 1887.

<sup>3</sup> H. H. Johnston. *The Kilima-Njaro Expedition.*

<sup>4</sup> H. Meyer. *Across East African Glaciers.*

<sup>5</sup> E. Whymper. *Scrambles Amongst the Alps. Chap. IV.*

Norwegian peasants have similar traditions. One of the most beautiful ranges in Norway, one of the most interesting I ever ascended, are the Trolltinder,<sup>6</sup> or Witch Peaks. They were named from their having a great many pinnacles of rock near their summit. These were supposed to have been a band of Trolls, who, in nightly orgy, forgot to return to their caves before dawn, and were then changed into stones, in which form they remain to this day. The feeling in former times in Scotland about the mountains is, I think, well expressed in the old Scotch ballad, "The Demon Lover:"

"Oh what hills are you, yon pleasant hills  
That the sun shines sweetly on?"

'Oh yon are the hills of Heaven,' he said,  
'Where you will never win!'

"Oh whaten a mountain is yon,' she said,  
'All so dreary wi' frost and snow?"

'Oh yon is the mountain of hell,' he said,  
'Where you and I will go!'"

It is interesting to note the very poetical names which are applied by the mountain peoples all over the world to their big summits, and the great difference in the feelings of the dwellers among the peaks from those of the modern unsentimental, realistic Englishman or American. The

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<sup>6</sup> I made the ascent of the Trolltinder (5,860 feet) from the Isterdal, with two Norwegian reindeer-hunters, on July 9 and 10, 1881. We left the Hotel Aak in Romsdal at eleven P.M., and were out exactly twenty-four hours. The way to the plateau from which the Witch Peaks proper spring was known to the hunters; it is up an exceedingly steep wall of rock of about two thousand feet in height. We ascended that one of the "Trolls" which seemed to us the highest. The pinnacle was easier climbing than the wall. Unfortunately for us, a storm coming up, we did not have much of a view. The hunters said no one had ever climbed the Trolltinder before, nor have I ever seen an account of an ascent. I picked up the antler of a reindeer on the plateau.



Englishman speaks of the Himálayas as "the Hills," and sometimes destroys the dignity of Mont Blanc by speaking of it as "Blank." To the great mountain of Nepal he affixes the name of a little Indian surveyor, "Everest," just as to the great falls of the Zambesi,<sup>7</sup> so poetically and accurately termed by the natives "Mosi-oa-tu-nya," "Smoke Sounds There," he applies the present regulation title, "Victoria." There is a fine grandeur to the old names of great peaks, "The Finsteraarhorn," "Dark Eagle Peak," the "Jungfrau," which needs no explanation; the "Wetterhorn" and "Uschba" in the Caucasus, meaning almost the same thing, "Peak of Storms;" the Schreckhorn, "Peak of Terror;" "Iotunheim" in Norway, the "Home of the Giants." African savages have poetical feeling enough to call their great mountains respectively, "Kilima-Njaro,"<sup>8</sup> "The Mountain of the Spirit Njaro;" and "Ruwenzori,"<sup>9</sup> "The Cloud King." Similarly, the Maories in New Zealand call their great peak "Ao-Rangi,"<sup>10</sup> meaning "The Light of Day," from being the first peak to catch the morning light and the last to show the glow of evening; the name "Ao-Rangi" also meaning "Scud Peak," because the cloud banners gather about the highest parts of the mountain. No more fitting title could be found for the great Asiatic range than its Sanscrit name, "Hima-Alaya,"<sup>11</sup> meaning "The Abode of Snow," with its twenty-nine thousand foot cloud-piercing culminating point, the highest measured mountain on the globe, justly bearing its Indian names,<sup>12</sup>

<sup>7</sup> D. Livingstone. *South Africa. Chap. XXVI.*

<sup>8</sup> H. Meyer. *Across East African Glaciers.*

<sup>9</sup> H. M. Stanley. *In Darkest Africa. Chap. XXX.*

<sup>10</sup> G. E. Mannering. *With Axe and Rope in the New Zealand Alps.*

<sup>11</sup> A. Wilson. *The Abode of Snow.*

<sup>12</sup> D. W. Freshfield. *The Great Peaks of the Himálaya. Alpine Journal, XII.*

“Gaurisankar” or “Deodungha,” “The Home of the Gods” or “The Abode of Deity.”

But one gleam of a desire for elevated things occurs in the Middle Ages. By a coincidence which should be interesting to Americans, the first real Alpine ascent took place in the same year as the landing of Columbus. The Mont Aiguille is described as one of the seven wonders of Dauphiné.<sup>13</sup> It is six thousand and eighty feet in height, and is a long narrow wedge, flat at the top, where there are grass and trees. One English climber says it has walls all around it, steep as a house, while another describes it as a paper-cutter set on edge. It was ascended by order of Charles VIII of France by his Chamberlain, Julien de Beaupré, with the help of ropes and ladders. The following account has come down to us :

“On June 26, 1492, I, François de Bosco, almoner to the Seigneur Julien de Beaupré, in company with other hardy adventurers, ascended the Mont Eguille, or Mont Inaccessible, and the day following, having said Mass on the said mountain, ate, drank and reposed thereon. The Seigneur Julien de Beaupré changed the name of the mountain from Eguille, or Montagne Inaccessible, to Eguille fort, causing it to be solemnly baptized in the name of the Holy Trinity by a certain Sébastian de Carect, one of the Royal Chaplains, and afterwards chanting the Te Deum, Salve Regina, and many other anthems.” They found numerous chamois on the summit, where they spent six days, and found the descent still more horrible than the ascent.

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<sup>13</sup> F. Gardiner. *A Week Amongst French Dolomites. Alpine Journal, XIV.*

The first undoubted ascent<sup>14</sup> of a *glacier-bearing* peak was that of the Buet.<sup>15</sup> This was ascended in 1770, by Jean André and Guillaume de Luc, of Geneva. Jean André published a book, "Researches on the Modifications of the Atmosphere," and it was for the purpose of making some experiments on the atmosphere that he ascended the Buet. On their ascent one of their guides accomplished the wonderful feat, which it is not explained how he contrived to live through, of sliding down upon his back fifteen hundred perpendicular feet. On reaching the summit the de Lucs found that they were standing only upon a mass of congealed snow which jutted out over a most frightful precipice. Their first impulse was "to retreat with all speed, but soon reflecting that the addition of their weight to this frozen mass, which had been supported thus for ages, could have no effect in bringing it down, went again upon that horrid terrace." This ascent is very interesting, both in showing that it was the desire for scientific information in regard to the atmosphere which led to this ascent, and the lack of scientific information of the day in regard to everything relating to ice and snow, in the de Lucs imagining that a cornice, which is blown up by the winds every Winter, and which always falls during the Summer, "had been standing there," as they conceived, "for ages."

In Central Switzerland the earliest explorations were made by the monks of different monasteries, such as the St. Bernard, the Simplon, Engelberg, Disentis. There is no doubt, from notes that have come down to us, that

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<sup>14</sup> The ascent of the Titlis by a monk of the Engelberg Convent in 1739, long considered the first ascent of a snow mountain, is now said to be doubtful. *Alpine Journal*, XVI, 66.

<sup>15</sup> D. W. Freshfield. *The History of the Buet*. *Alpine Journal*, IX.

these early explorers were led by the love of geographical exploration, and in the case of the greatest of them, Placidus a Spescha,<sup>16</sup> scientific knowledge and a love of mineralogy and geology were added to a desire to know the boundaries and the formation of the mountains with which he was immediately surrounded. He is certainly one of the most interesting figures amongst early mountaineers, leaving a large collection of minerals and many notes of his ascents. There is a great deal of naïveté in many of a Spescha's doings. In an ascent of Piz Valrhein in 1787, as mountaineers had not then grasped the value of the rope, a Spescha and his three companions and his guide were reduced to grasping each other's coat-tails—as far as they went—for half-way to the top, his companions getting frightened, he cut steps in the snow for them, and left them sitting in these steps whilst he completed his ascent alone, and two or three hours later, on his descent, he found them still sitting there.

Mont Blanc again falls before the desires of a scientist.<sup>17</sup> In 1760 the celebrated geologist de Saussure visited Chamonix, and offered a large reward to anyone who should discover a route to the summit of Mont Blanc. Several attempts were made by the Chamonix guides to reach the top, and they reported to de Saussure that it would be useless to take provisions, as he would be quite unable to eat, and recommended him to take nothing but a light parasol and a bottle of scent. Three guides finally started on June 8, 1786, and reached the arête joining the Dome du Gouté to Mont Blanc, and considering further

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<sup>16</sup> D. W. Freshfield. *Placidus a Spescha and Early Mountaineering in the Bündner Oberland. Alpine Journal, X.*

<sup>17</sup> W. Longman. *Chamonix and Mont Blanc. Early History. Alpine Journal, VIII.*

ascent too dangerous, returned. One of the party, Jacques Balmat, remained behind, however, spending the night in a hole in the snow, and the next day began his explorations, and discovered a route which led to the summit, nearly reaching it himself. He was utterly exhausted by fatigue and exposure, and was ill for weeks on his return to Chamonix. Dr. Paccard, the village physician, attended him during his illness, and in return Balmat told him of what he had done, and offered to take him to the summit. On the 7th of August, 1786, they started without companions, and reached the highest summit about six P. M. on the next day. De Saussure himself ascended Mont Blanc the following year with ten guides, and he made many other expeditions in the Alps, either scientific or geographical in their character.

In the Oberland mountaineering comes shortly afterwards.<sup>18</sup> The Meyers of Aarau had long been distinguished as topographers and students. To clear up the geography of the Oberland, the Meyers, accompanied by two chamois hunters, made the first ascent of the Jungfrau, on August 3, 1811, and the following year the Finsteraarhorn, the "Dark Eagle Peak," the highest of the peaks of the Oberland, was ascended by the same climbers. This ascent has been much disbelieved in until within a few years. The Meyers started from the Grimsel and had an exceedingly difficult climb, so hard that it has never been repeated until quite recently. The peak was as sharp as a house roof, and entirely plastered over with ice, which hung out for several feet over the precipice, so that the Finsteraarhorn glacier was seen through a hole in it.

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<sup>18</sup> W. Longman. *The Oberland District. Alpine Journal, VIII.*

The next ascents of importance<sup>19</sup> were those of the Wetterhorn from Grindelwald by Mr. Wills in 1854, the conquest of the highest peak of Monte Rosa in 1855, and the ascent of Mont Blanc without guides in 1856, which ascents led to the formation of the Alpine Club in 1857, and the science of modern mountaineering may be said to date from that time. Since then, a Swiss, a French, an Italian, a German, an Austrian and a Norwegian Alpine Club have been formed, who number their members by the thousand, and the mountains of Switzerland have been explored in every nook and cranny.

I have mentioned the need of the mountains being explored by trained mountaineers, and the following example will show what I mean. In 1863 the Mont Blanc chain, lying directly in front of Chamonix, and visited yearly by thousands of tourists, had been mapped out by the Sardinian army survey.<sup>20</sup> On this map, amongst others, were two peaks, the Aiguille d'Argentière, and the Pointe des Plines. These were marked as being a mile and a half distant from one another, and as being six hundred and seventy-two feet different in height. The Sardinian surveyors, of course, had done the best that could be done by men who were not mountaineers and who were afraid of the snow. Mr. Adams Reilly,<sup>21</sup> a member of the Alpine Club, thought from one or two ascents he had made that the map of the Mont Blanc chain was not very accurate, and decided that he would survey the chain himself, and to carry this out, amongst other things, he planned the

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<sup>19</sup> Sir Frederick Pollock. *The Badminton Library*. "Mountaineering." *Chap. I.*

<sup>20</sup> E. Whymper. *Scrambles Amongst the Alps*. *Chap. XI.*

<sup>21</sup> Adams Reilly. *A Rough Survey of the Chain of Mont Blanc*. *Alpine Journal*, I, 266.

ascent of both the Aiguille d'Argentière and the Pointe des Plines. His survey showed one very curious and unexpected result: that these two peaks, which lay almost in front of Chamonix, but were a mile and a half apart, and in whose heights there was a difference of six hundred and seventy-two feet, were absolutely one and the same, seen from different sides and wrongly measured. The difference in height was possibly due to the surveyors measuring different points of the same mountain as the summit. Mr. Reilly concluded not to ascend the Pointe des Plines.

If we turn to a map of the Caucasus of thirty years ago—or less than that, twenty-five years ago—we find the Caucasus represented on the map by a sort of caterpillar with a hump at each end; these humps were called respectively Mount Kasbek and Mount Elbruz. All the Caucasus Mountains, a range almost as large as Switzerland, with such peaks as Koshtantau and Shkara, over seventeen thousand feet in height, were utterly unknown until Mr. Freshfield's expedition in 1868,<sup>22</sup> in which he, with two other members of the Alpine Club, and that most splendid of guides, François Dévouassoud, for the first time brought to the notice of the world the Caucasus as one of the greatest of mountain chains.

Many other of the mountain districts of the world have already been reached by mountaineers, which until their advent had remained terra incognita; but, barring Switzerland and the Pyrenees, which have been entirely explored by the different Alpine Clubs, there is no chain of mountains which is as yet thoroughly known or perfectly mapped out. New Zealand, though settled and

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<sup>22</sup> D. W. Freshfield. *Travels in the Central Caucasus and Bashan.*

inhabited by Englishmen for many years, had to wait until a few years ago for Mr. Green to first explore its Alps.<sup>23</sup> The Himálayas, although the Indian Government has tried to map and explore them, are still, in many cases, keeping their secrets until men shall come along who know the science of climbing. Mr. Graham's trip in the Sikkim Himálayas in 1886 showed conclusively how little was known about the Himálayas, as he has now left us in doubt as to whether the two peaks which he saw from the top of Kabru were not higher than Gaurisankar.<sup>24</sup>

In America there is a large field left for mountain exploration. Of the Selkirks we know but little; Saint Elias has not been reached; the Alaskan Ranges and Mount Fairweather and Mount Cook are, I believe, entirely untouched. The Mount Wrangell Range is hardly known, even by name, and though it is said to have been measured and to be over twenty thousand feet high, we know practically nothing about it or its surroundings.<sup>25</sup> On the map of the Northern Rockies, north of the Selkirks, we find a bunch of peaks, called Mount Brown and Mount Murchison, and marked as being over sixteen thousand feet high. Of these mountains we again are in almost complete ignorance, though from Mr. Green's explorations we may doubt the accuracy of their supposed altitude.<sup>26</sup> In South America the Andes of Peru and Chili are mostly still unascended, and even Ecuador has had

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<sup>23</sup> W. S. Green. *High Alps of New Zealand.*

<sup>24</sup> W. W. Graham. *Travel and Ascent in the Himálaya. Alpine Journal, XII.*

<sup>25</sup> H. W. Elliott. *Our Arctic Province, p. 77.* "The Triangulation of Mount Wrangell is said to have been made in 1885, by Lieutenant H. T. Allen, U. S. Army."

<sup>26</sup> W. S. Green. *Among the Selkirk Glaciers.*



only one serious exploration by Mr. Whymper.<sup>27</sup> I mention these facts particularly because it seems to me that if the Geographical Club ever becomes strong enough to think of fitting out exploring expeditions, it will find in some of our Western mountain regions unexplored country enough for many years, and I hope to see our Club come to the front in helping to clear up the mountain geography of America.

Turning now to what mountaineering has done for science, the glacial phenomena, and the forms of water in ice and snow and clouds, have been studied with care and trouble by such men as Tyndall,<sup>28</sup> Forbes,<sup>29</sup> Agassiz,<sup>30</sup> Escher von der Linth, Guyot, who have camped out on some occasions for weeks at a time. There was the famous expedition of 1842, when the movements of glaciers were practically first determined, when the Neuchâtel scientists lived on the ice for two seasons, under the protecting shelter of a boulder, which became known to Alpine fame as the "Hotel des Neuchâtelois." The geology of the mountains has been studied by such men as Professor Bonney of London and Professor Shaler of Harvard University. Botany has had its devotees in such men as Packe, and a little botany I have noticed myself, would not, perhaps, come amiss this evening. The Alpine flower, the Edleweiss, is now very rare in Switzerland, but I have come across it three times; and in two of these cases it was in a perfect field, in remote corners of the Alps. I suppose in both these instances it would have covered a lawn of perhaps half

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<sup>27</sup> E. Whymper. *Travels Amongst the Great Andes of the Equator.*

<sup>28</sup> J. Tyndall. *The Forms of Water ; Hours of Exercise in the Alps.*

<sup>29</sup> J. D. Forbes. *Occasional Papers on the Theory of Glaciers.*

<sup>30</sup> L. Agassiz. *Geological Sketches.*

an acre, and, contrary to tradition, it was not in inaccessible places.

Botany naturally suggests zoölogy. Many people think that the chamois is now extinct in the Alps to a great extent, and the ordinary traveller hardly realizes how many of them are left above the snow line. In certain parts of the Alps they are frequently visible, sometimes in herds of forty or fifty. I once had the pleasure of watching a chamois through a telescope, from a rock where we were taking lunch. This chamois was crossing a glacier below us, and was quite unconscious of our presence. It was very interesting to watch how the animal threaded his way amongst the crevasses, and seemed to know where he might go with safety, and wandered up and down, jumping the crevasses, leaping from one bit of ice to another. On another occasion, Mr. Binney and I, in trying to ascend Piz Julier in the Engadine without guides, came within a few yards of a chamois, who was taking his noonday siesta under a large rock.

Monsieur Janssen, of the French Academy, made an expedition two years ago to the top of Mont Blanc,<sup>31</sup> to determine, by means of spectroscopic observations, the presence or absence of oxygen in the solar atmosphere. His observations are scientifically, I believe, of a great deal of value. He himself states that he considers it an established fact that oxygen is absent from the solar atmosphere, and an attempt has since been made of building an observatory on Mont Blanc for further observations, which attempt, however, the mountain has literally, as well as figuratively, frozen out, by freezing some of the

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<sup>31</sup> *Alpine Journal*, XV, 326.

porters so badly that the attempt was given up.<sup>32</sup> In order to make his experiments, being an old man, and not much of a climber, Monsieur Jannsen made his ascent in a very peculiar way. He had a sled made, and having first been carried to the ice at the Pierre Pointue, twenty-two guides dragged him on his sled to the Bosses and to the top. This may seem rather an odd manner of climbing, but as a result he found himself on the summit in the full possession of his intellectual powers, and was able to carry out his scientific task without the smallest difficulty or fatigue. From this fact he concludes that the trouble that de Saussure and others experienced in working at high altitudes was due to physical exhaustion. Monsieur Jannsen evidently did not believe in the effect of the rarified air, believing, as many climbers do, that it is the want of training, and not the atmosphere, that affects us at great heights. I believe, myself, that the thin air has a great effect on us. I have noticed it not only in myself, but in others. If any one stays two or three weeks at a time on the Riffelberg, which is eight thousand four hundred feet high, they are very apt to develop a tendency to sleeplessness and exceeding nervousness, which can be cured by descending to a lower altitude. Professor Heilprin gave us an account two years ago of his ascent of Citlalpetl and I was very much struck with his statement that when he got near the top, eighteen thousand feet high, he could not take more than five or six steps at a time without stopping to breathe. This has also been my experience at great elevations. After passing somewhere about twelve thousand feet, it is necessary

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<sup>32</sup> C. E. Mathews. *New Experiences in the Old Playground. Alpine Journal, XVI, 24.*

to take very short trips and then stop. In the highest ascent I have made, that of the Nadelhorn,<sup>33</sup> fourteen thousand three hundred feet in height, and therefore some four thousand feet less than Professor Heilprin's, I found that towards the end my limit with any kind of comfort was about twenty-five steps or so, when it became necessary to take a breathing spell. I found a snow ball with a spoonful of brandy on it to be an exceedingly grateful treat under the circumstances. There is, of course, no question but that different people have different altitudes which they can reach, or at which they can work. I have been told in Switzerland, though I cannot vouch for the statement, that there are some of the Chamonix guides who have never been able to reach the top of Mont Blanc, as their breathing powers gave out, and they have not been able to go farther than the Grand Mulets, or the Bosses. In Mr. Graham's ascent of Kabru, in the Sikkim Himálayas, a height of at least twenty-three thousand and seven hundred feet was reached, by long odds the greatest height ever ascended.<sup>34</sup> His party had risen gradually until they got to the foot of the mountain, some seventeen thousand feet up, and were, therefore, already used to the rarified air, but he says that neither himself nor either of

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<sup>33</sup> I made the second ascent of the Nadelhorn (4,334 metres), which was the first by a traveller, on June 29 and 30, 1882, with the guides Franz Burgener and Alois Anthamatten. Leaving Saas im Grund at two o'clock in the afternoon, we bivouacked on the side of the mountain, and leaving our camp at four A.M., reached the col between the Ulrichshorn and Nadelhorn at half-past nine o'clock, and the summit of the latter about two P.M. The final arête took us four hours, although it was easy climbing. We followed the same route as the guides, who, led by Franz Andermatten, are said to have made the first ascent in 1859. We found absolutely no traces of any previous ascents. Compare W. M. Conway's paper: *The North District of the Saas Grat. Alpine Journal, X, 338.*

<sup>34</sup> W. W. Graham. *Travel and Ascent in the Himálaya. Alpine Journal, XII.*



Nadelhorn

Balch



his guides seemed to suffer from the rarified air, the curious thing in this so exceedingly high ascent being that the only apparent effect was a very strong beating of the heart, so loud that it was quite audible.

In regard to the possibility of a greater height than Mr. Graham's ascent being reached, I think that Lieutenant Peary's dress on his Arctic trip has possibly opened the way. His Eskimo reindeer suit, whose entire weight was only eleven and a half pounds, will, if properly utilized, probably add to the limit of the altitude that can be reached by man. It is impossible in climbing at great altitudes to carry but very little, and that little must of necessity be food, and climbers are often driven back by the inability to take with them some cover in which to sleep out. Mr. Peary's dress seems to obviate this difficulty, as with it he was enabled, by just burrowing into a hole in the snow, to sleep with perfect comfort. I hope to see some climber try this dress; it would enable a man to sleep out very high up, and to push on for several days as long as he had provisions, without being forced to return when perhaps within easy reach of his summit, by the necessity of getting to a camp where there were tents and sleeping bags.

I should like to mention here in connection with food, that a most invaluable article of diet on a mountain side is a roll with a plentiful supply of butter and honey, in equal parts, put inside. There is no food that stops thirst quite as effectually as this, and it can often be eaten when one is too jaded for anything else.

There is another point, besides geographical explorations and scientific experiments, in which the mountains appeal to many persons, and that is the beauty of the scenery. It has appealed to artists and to photogra-

phers.<sup>35</sup> It would not be possible to write a paper on mountaineering and not refer to the work accomplished by the distinguished landscape painter, Gabriel Loppé. He has done, to me, some of the most wonderful feats of getting pictures under difficulties. He trained a guide to act as his artistic porter, and to carry his umbrella, boxes and canvas, and arrange them all on arriving on a peak, while he himself could get a breathing space, and his man would then pack his things up again, so as to save him all trouble after his sketching was done. Loppé showed me in his studio a number of sketches—large oil sketches—which he has made from the tops of such mountains as Monte Rosa, the Rymfischhorn and Mont Blanc. He has staid three weeks at a time at the hut on the Col du Géant, to paint, his provisions being brought up six thousand feet from Courmayeur every day. One of his most curious feats was painting a sunset from the top of Mont Blanc. He said it was very hard to induce the guides to go with him, as everybody said that no one could possibly be on Mont Blanc late at night and come down alive, and he told me that it took him a long while to make his guides comprehend that if people ascended by lantern light, they could surely just as well descend by lantern light. This was long before the days of the hut on the Bosses, and he therefore had to descend the entire way to the Grand Mulets at night, a matter of five or six hours' climbing.

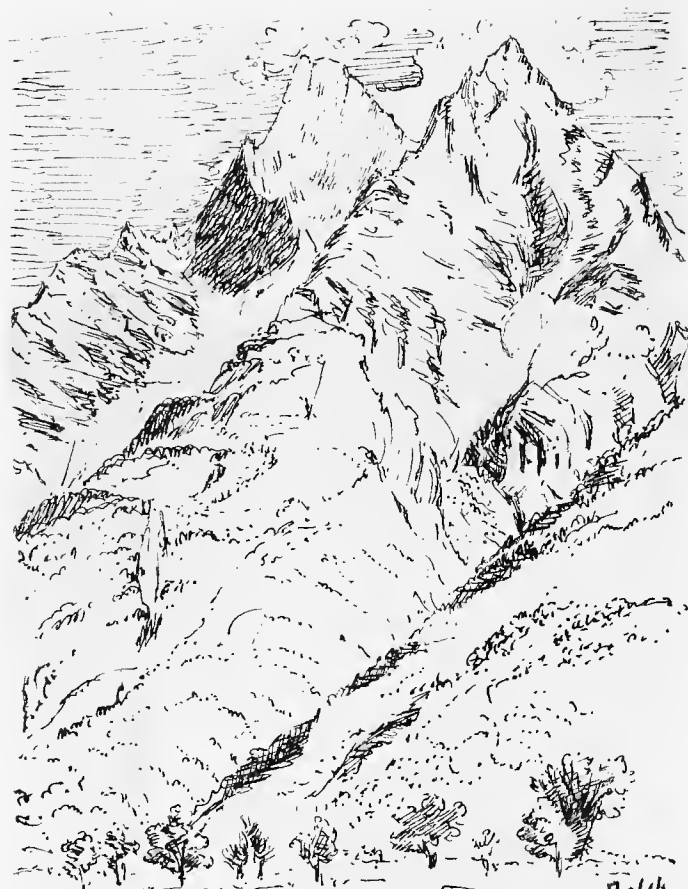
No one can look at Mr. Whymper's books, with those wonderful illustrations, without being aware that it was something more than a mere desire to get up mountains that induced him to go to the Alps and the Andes. Mr.

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<sup>35</sup> The illustrations accompanying this paper are phototypes by Messrs. Gutekunst & Co., of Philadelphia, from sketches by the author. The first is the peak of the Nadelhorn; the second, the Mont Emilius from Aosta; the third, the range of the Dent du Géant from Courmayeur, and the frontispiece Nägeli's Grätli from the Grimsel.







Monte Emilius + Bocca di Nona  
Aosta Aug 30/16

Balch

Donkin and Signor Sella have carried cameras to the tops of the big peaks of the Alps and the Caucasus, and photographs have been taken from, and of, places that look, and are, almost inaccessible. But fruitful though such a remark may be in raising a never-ending discussion, I feel that it is necessary to warn my hearers that mountain photographs do not in all respects give the only accurate appearance of the mountains. I believe that they are topographically accurate, but with a tendency to rather diminish the steepness of the lines; while the mind unquestionably has the tendency to exaggerate the steepness of the mountains. When any one who has never seen the mountains except in photographs gets to the mountains, he will find them much larger than he had any idea of. A photograph gives all the details more accurately than any but the most elaborate painting, but it can never give the suggestion of the scene, in the way that a firm water-color sketch can do. Drawing and form are the flesh and blood of landscape, but color and effect are its soul, and these are lacking in photography. I mention this as I do not wish to see the Kodak usurp entirely the place of the water-color box in the traveller's outfit. Herr Alexander Seiler, the great hotel proprietor, the uncrowned king of Zermatt, showed that he understood the greater mental effect of painting, for when he wanted to advertise the new hotel on the Riffelalp, he did not have a photograph taken from nature, but he first had a painting made, and this photographed. By so doing, the Matterhorn rose in its full majesty, as it is suggested to the mind, and not simply topographically accurate as a photograph would have made it. This photograph from a picture was to be seen all over Switzerland a few years ago, and I have no doubt, brought not a few francs to the pocket of that clever Herr Seiler.

## II.

The first beginnings of mountaineering; and, indeed, all early mountaineering, are entirely free from any taint of the modern climber's idea. There are no attempts to get up a mountain by the wrong side, simply for the sake of doing something that nobody has done before. The early climbers climbed either from a desire for geographical exploration, or to make scientific discoveries, or for the sake of the scenery. At first alpenstocks were separated from the axes, and scientific travellers carried the geological hammer to cut steps. Ladders were used in all the early explorations, we are told, to bridge the crevasses. The art of mountaineering has now been thoroughly studied, and we find the use of the rope and the ice axe universal amongst good mountaineers.<sup>36</sup>

There is a difference between mountaineering and climbing which I should like to insist on, as it is not always quite understood. Mountaineering in itself rather belongs to the field of geographical exploration, and climbing proper is only a branch of it—though a very important one. A man might be a good climber and yet a poor mountaineer. In mountaineering proper it is the head which does the work, not the muscles. It is a question of knowledge, not of mere physical force; knowledge to find the

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<sup>36</sup> Any members of the Club who may turn their attention to mountain exploration, will find much valuable information about "Equipment" in *The Report of the Special Committee on Equipment for Mountaineers*, in the May number of the *Alpine Journal for 1892*, XVI. Longmans, Green & Co., London. This report can be had as a separate pamphlet. It contains a list of firms who supply English mountaineers. There is a chapter on "Equipment" in *The Badminton Library: Mountaineering*, by C. T. Dent. Longmans, Green & Co., London, and Little, Brown & Co., Boston. Many useful hints can also be found in F. Galton's *Art of Travel*. John Murray, London.

road, to keep it, to read the weather. The traveller's part is not one of mere mechanical effort; his can be more the head work, while the guide is certainly better as far as mere muscular strength and skill. There is very often some perfectly easy way up some great and fearfully inaccessible-looking mountain, and good mountaineering consists in finding that safe and easy way. In sheer climbing you start to break your neck or not, just as it happens.

To make a good mountaineer is a matter of time and practice. Going to Chamonix and being led up Mont Blanc by three or four guides, and then going to other places and just being led up big peaks is not the way by which good mountain explorers are made. The best way, perhaps, would be doing a great many small climbs at first without any guides, to gradually acquire proficiency of the elementary principles, and occasionally take a climb with a good guide to study his methods.

If you take a first-class guide you get the very best skill that can be had, as he has all the advantage of thorough head knowledge and all the physical skill, which I believe is never really acquired by anybody who has not been born and who has not lived in the mountains all his life. The ordinary guide has certain physical advantages over the amateur, which in almost all cases more than counterbalance all the amateur's knowledge. He is not always stronger than the amateur; indeed, he may be the weaker man of the two, but he knows better how to apply his strength. He is able to get up and down rocks on which an amateur is perfectly helpless, and by the help of the rope to haul along the amateur after him. From long experience a guide is generally much more likely to hit the right way on a new mountain than any amateur; he is also generally better able to read the weather and tell the

likelihood of any storms, and if caught in a storm he is much more sure of retracing his steps.

Perhaps the first thing that a mountaineer should learn is the value of an early start ; too many people lose an hour or two in the morning, and will, perhaps, be rushed all day in the hope of accomplishing their expedition before nightfall. In high climbing it is generally best to start in the small hours ; in fact, it is possibly best to start in the late hours of the night, and if climbers would only remember this they would often save themselves much extra fatigue, and avoid the danger of thunder-storms which are most frequent towards nightfall.

One of the elementary rules of mountaineering, and one which it seems to take a long time to acquire, is to learn to walk very slowly, very steadily, and one might say rhythmically. The Chamonix guides have a maxim : " Plus doucement on monte, plus vite on arrive au sommet," and amongst the Italians there is an old saying, " Chi va piano va sano, chi va sano va lontano." The real secret of mountain walking is *not* to make halts ; if the slope steepens, to slow down your pace so as not to break the rhythm of your step, and on rocks to try to accomplish every bit with the most methodical regularity and the least possible gymnastic effort.

Reconnoitring a peak belongs more especially to the mountaineers, not to the climbers. Reconnoitring is studying out the best route, and knowledge and brains will tell here. In this branch an amateur may become as proficient as the best guide, and may be much superior to any second-rate guide. This part of mountaineering has not generally enough stress laid on it. To make a new ascent the peak should be well studied beforehand, so that the right line of ascent for the entire distance should

be taken. It is very much like painting a picture or writing a paper for the Geographical Club in this respect; that is, you should first grasp the whole, and only later the detail. To try to work out your route whilst you are actually ascending is the best plan to fail. If possible, it is always best to lay out your route beforehand from some other mountain facing the peak. From there you can see your entire route far better than you can when you are on the mountain itself, when it is quite impossible to lay out the best course to be followed. You have to consider whether you will ascend by the face and through couloirs—that is, snow gullies on the face of the mountain—or by one of the arêtes—that is, by one of the long ridges that lead to the summit. Alpine authorities incline both ways; some to the faces and some to the arêtes. For my own part, I am inclined to prefer the back of the ridge, as I think one is in less danger from either stones or avalanches. This art of reconnoitring a peak so as to pick out the best route is one that can only be acquired with a good deal of experience and by careful knowledge and study of mountain structure. Some years ago I made an ascent with Mr. Seton-Karr, who has since done so much exploring in Alaska.<sup>37</sup> We each decided on what we considered the best route for our peak. He said an arête was the best; I inclined to a couloir on the face of the mountain, basing my belief, I am afraid, on Mr. Whympers's theories. We eventually went up by my route, and were just able to get up, as towards the top our mountain was almost impracticably steep. We came down by Mr. Seton-Karr's route, with the result that—if I remember aright—we did not have to put on the rope the whole way down.

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<sup>37</sup> *Alpine Journal*, X, 162.

In general I think one may assume that snow travelling is easier than rock travelling. It might be laid down as an axiom that where snow can lie man can go. Rock aiguilles, such as the Dru, are the hardest climbing of all. Snow travelling and ice travelling are generally very pleasant forms of walking, as there is something pleasanter in the application of the boot to snow than to rock. As a rule, of course, snow slopes are not very steep, and beyond a certain limit of steepness—such as thirty-five degrees—it is safer for an amateur not to meddle with them. When one is on snow mountains of any degree of steepness one must always be on the lookout for avalanches. There have been cases where parties have been swept away by avalanches which have come down from above them. There have been cases such as Professor Tyndall's on Piz Morteratsch,<sup>38</sup> where the avalanche has originated in some one of the party slipping and the whole mass of snow moving down the side of the mountain with the party. In Tyndall's case, as in many others, it was due to bad guiding. An expert can almost always tell by the consistency of the snow whether it will lie safely, and whether it is safe to go on it, and one can generally see a long way ahead, from the lay of the snow, whether there is any immediate danger of avalanches. The unpleasant part of snow travelling is, when the snow is soft and you sink in at every step; sometimes up to your waist, when it may become a matter of difficulty to extricate yourself, and certainly not without much effort and fatigue.

Step cutting, which is a very important part of snow travelling, is difficult to do well, and is not to be learned without a good deal of practice. It is something like a

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<sup>38</sup> J. Tyndall. *Hours of Exercise in the Alps.*



stroke in rowing; beginners are apt to use simply the arms, while step cutting, to be effective for any length of time, needs the use of the muscles of the shoulders and the back; the arms being rather the means of communication by which the force of the body is carried to the head of the axe. If you cut simply with your arms you will very soon grow tired. But an experienced step-cutter will work for a long time because he is using his entire muscular power. Probably the best way to acquire proficiency in the art would be to practise it at first under the teaching of a good guide.

In snow travelling it is also of the greatest importance to the amateur to learn how to sound for crevasses with the point of his axe, and this is a point that in going with guides is very much neglected, though when you are mountaineering without guides it is one of those things that must be used on every snow field. I believe there is nothing but experience that will tell you when you drive your axe through the snow as to whether you are driving it into solid snow, or whether there is a crevasse underneath.

Speaking of crevasses naturally suggests the rope. Mark Twain, in his ascent of the Riffelberg, states that he started from Zermatt, and that for fear of accidents he and his secretary, Harris, were each securely lashed on the high road to five guides apiece. Mark Twain thought he was only funny, but in reality he had hit one of the most important rules of climbing. A great many accidents would be avoided if people would not be afraid of seeming afraid, and would only be willing to put on the rope when the work is not very difficult. The less a person has climbed, as a rule, the more willing is he to take the risk of walking over snow-covered glaciers without being roped. For instance, to quote from my own expe-

rience, my brother and I went last year to the Jardin. Our guide was François Dévouassoud, one of the best men in the Alps, who was Freshfield's guide in the Caucasus. He did not object in the least to putting on the rope for all the work we did on the glacier de Leschaux, but thought it, on the contrary, extremely wise. A Frenchman made the excursion at the same time with us. He had never been on a glacier before, and his guide did not even take the trouble to have a rope. He did not come to grief, but I could not help thinking, as I saw him walking amongst the crevasses, that if anything should happen, of course people would blame the mountains and not that stupid Frenchman. This falling into snow-covered crevasses, where people are not roped together, is a form of accident which almost every year kills some travellers, and for which the mountains get all the blame; though to illustrate how you can fall into crevasses and not think anything about them if you are roped in the proper way, and also to show the difference in power between a first-rate guide and his employer, I can instance a long tour I made with a prominent member of the English Alpine Club, and the two well-known Tyrolese guides, the Spechtenhausers.<sup>39</sup> Our guides were on each end of the rope and we were in the middle. We would come to some hidden crevasse; the first guide would sound with his axe and then step over it; my English friend would then come and sink in; I would then sink in, and the last guide would step over the crevasse without the least apparent effort. Tumbling into a crevasse, if you are roped, is a very small matter, although the sensation if you fall completely through is unique. The most curious part of the

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<sup>39</sup> A. J. Butler. *Notes on the Eastern Alps. Alpine Journal, XI, 123.*

feeling is the inability to put your feet anywhere, the sensation of utter helplessness that it gives you to be kicking around trying to get your feet on to something. From being on the ice and snow in the light you suddenly find yourself in semi-darkness. The dark green-blue ice rises in front of you, a lot of very cold snow falls down the back of your neck, your hat goes down from you, and you are half crushed by the rope, until the people who have not gone in haul you out by main force, and you are landed in a confused heap on top of the glacier.

On snow arêtes it is imperative to keep a sharp lookout for cornice; that is, the overhanging snow on the arête, where the snow has been beaten up by the winter winds, curled over, and is hanging in space. In ascents early in the year, before the cornice has fallen, parties are sometimes in great danger who do not know enough to keep away from these cornices. Several accidents have occurred on the Lyskamm at Zermatt from this cause. A good mountaineer will generally reduce the danger to a minimum by leading you exactly on the top of the ridge, and not on the overhanging snow; but if the ridge is exceedingly sharp, it is very difficult not to walk on the cornice, as, if you attempt to walk on the other side, you are in danger of detaching avalanches where it is very steep.

The most wonderfully narrow escape on record had Mr. A. W. Moore,<sup>40</sup> in a descent of the Mönch with Melchior and Jakob Anderegg; Melchior is renowned in Alpine fame as the best of guides. I quote Mr. Moore's own words: "As far as the point of bifurcation the inclination of this southern arête is very moderate; beyond that point it becomes steeper.

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<sup>40</sup> A. W. Moore. *The Mönch and Jungfrau from the Wengern Alp. Alpine Journal, VII.*

It is as narrow as an arête can be. On the left hand it is an absolute precipice; on the right a slope which might be called precipitous, falls to the Aletsch Glacier. The quantity of snow on the ridge was enormous, and the sun had begun to tell on it. We knew too much to attempt to approach the upper edge, and kept at a distance of some twelve feet below it on the Aletsch side; lower down we dared not go, owing to the steepness of the slope and the danger of starting an avalanche. With Melchior in front, it is unnecessary to say that we moved with the greatest caution: no man is more alive than he to the danger arising from a snow cornice. He sounded with his axe at every step, and we went steadily along, anxious, but with every reason to believe that we were giving the cornice a wide berth. Suddenly came a startling cry from Melchior: at the same instant I felt myself stagger, and instinctively swinging ever so slightly to the right, found myself the next moment sitting astride on the ridge. With a thundering roar the cornice on our left for a distance of some two hundred yards, went crashing down to the depths below, sending up clouds of snow dust which completely concealed my companions from me. It was only by the absence of all strain on the rope that I knew—though at the moment I scarcely realized the fact—that they were, like myself, safe. As the dust cleared off, Melchior, also sitting astride of the ridge, turned towards me, his face white as the snow which covered us; that it was no personal fear which had blanched our leader's sunburnt cheeks, his first words, when he could find utterance, showed: 'God be thanked!' said he, 'I never thought to see either of you here.' We had, in fact, escaped destruction by a hand's breadth. As I believe, our right feet had been on the ridge, our left on the cornice, and we had just sufficient

firm standing ground to enable us to make that instinctive movement to the right which had landed us *à cheval*; for Jakob had fallen in the same position as myself. Few words were said, but words poorly express the emotions at such a moment. Melchior's axe had been carried down with the cornice as it fell, but had fortunately lodged on the face of the precipice fifty feet below. It was too precious to leave behind, so we let him down by the rope, and descending in the cat-like way peculiar to first-class guides when not hampered by *Herrschaft*, he regained it without difficulty."

As far as I am personally concerned, I am inclined to prefer rock climbing to snow climbing. I suppose that it is with me, as with most amateurs, that one has so much more opportunity of practising in crags at a low altitude, that one acquires a much greater proficiency in the art. When it comes to climbing very bad rocks, I think there is no question that a good guide is better than any amateur; but the charm of rock climbing is that one is always more or less independent. With a little care there is comparatively little risk on rocks. I notice that people always think that the most dangerous thing in the mountains—the one danger that they seem to notice, is that of slipping; every one thinks he will slip and fall. This is, however, by no means as serious a risk as people think, if proper precautions are taken; unfortunately, proper precautions are not always taken. I once met an American tourist who was about to ascend the Riffelhorn. He started to tell the landlady what to do with his effects in case he should be killed; he thought of making his will. I told him that if he would only put nails in his boots, instead of going up with smooth heels, he would be in no need of any such proceeding, as he would then be in no likelihood of

slipping—the only possible risk on the Riffelhorn. It is wonderful how quickly, in a bad place, a man drops from his position as lord of creation and crawls around on all fours, or lying or sitting down, or in any other strange position in which he may feel most secure. I remember once crossing an arête; at one place the rocks were thin, flat slabs, overhanging on one side, and on the other set at an angle of about seventy degrees. Being perfectly smooth, there was no foothold for a distance of about thirty feet, and we had to move along by hooking our elbows over the tops of these rocks and hanging on to them by main force. In descending bad rocks it is generally well to turn your face towards them, and it is always well to remember that a rock may be loose and prove insecure as a handhold or foothold. The only rule that can be given at all as applying to bad rocks is that one should have at least three points of attachment to them, either one hand and both feet, or both hands and one foot.

A great and very real risk is the danger of falling stones; because it is one of those risks which it is almost impossible to guard against. After one has travelled much in the high Alps there is a certain sound of a crack above by which one learns to know that a stone is loose, and which makes one instinctively get ready to hide or to run. I had a very close call myself some years ago in a place where any of the ladies of this Club who should happen to visit the Dolomites, and who should wish to take the much-travelled route from the Ampezzo to the Grödner Thal, would undoubtedly pass. It was on the bridle path between Caprile and Campidello. The path at one place leads through the very narrow Sottoguda gorge. Cliffs rise on both sides several hundred feet in height. We were a rather large party, one of whom was an Italian

with a little child. We were walking quietly along, when there was a crack overhead—that peculiar crack which is so uncomfortable to a mountaineer. I remember stopping instinctively, and before I had time to look or move, a boulder struck the ground exactly in front of me, and where my very next step would have been. Another flew right over our heads. Of course, we all promptly ran away: one always does in such cases. I mention this particularly in order to show that it is not necessarily in the very high mountains, but often when not actually climbing that you meet with the greatest risks. A stone coming on a mountain side has a very peculiar sound. It hums exactly like a hornet. Sometimes it travels so fast that you will not see it, but you will hear it go by you like a rifle bullet. On a steep mountain side, such as the side of the Matterhorn, when a stone does come, it is curious how quickly a party in a place where they cannot run will flatten themselves out against the rocks. I believe it is an undoubted fact that stones coming down a mountain side leave a smell of sulphur behind them;<sup>41</sup> at any rate, all the natives are agreed as to who it is sends them.<sup>42</sup>

Another danger constantly present, or at least one for which experts are always on the lookout, is that of being caught in a storm. This is probably the greatest danger in the mountains. Parties have started out, been caught in a storm, and have never returned, either lost in a crevasse, or frozen in the snow, or struck by lightning. There is a good deal of danger if you are caught in

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<sup>41</sup> E. Whympier. *Scrambles Amongst the Alps. Chap. V.*

<sup>42</sup> E. Javelle. *Souvenirs d'un Alpiniste.* "Quand tout fut passé, Knubel, qui n'essayait pas pour la première fois le feu de cette batterie, dit avec un singulier sourire; 'j'espère qu'il se tiendra tranquille maintenant, allons et passons vite, c'est ici que nous sommes le plus exposés.'"—"Ascension au Cervin."

a storm of getting irretrievably lost; such as, for instance, in the ascent of Mont Blanc in 1870, where eleven persons—three tourists and eight guides—were lost and the bodies of only five were recovered;<sup>43</sup> or the expedition of Count Villanova, two years ago, which, led by Maquignaz—the first climber of the Dent du Géant, and one of the best mountaineers in Switzerland—started out from Courmayeur for Mont Blanc and was never heard from, as a fearful storm came up, and they probably perished in a crevasse somewhere.<sup>44</sup>

To illustrate the danger of storms, amongst occurrences of which I know personally, our President told me of an adventure he once had on the Grimsel. He started from the Rhone Glacier with two Englishmen, about five o'clock one afternoon. The sky was perfectly clear, but on arriving at the top of the Grimsel towards dusk, on the Swiss side, they were met by a perfect whirlpool of cloud which came up from the north, and a violent snow-storm made them lose their way. They sat down alongside some boulders; it was growing dark, and they knew not where to go. The party could never have endured an Alpine night in such a storm, and would probably have perished if it had not been for the dogs at the Grimsel Hospice. I was at the Grimsel the same year, and the man who kept the Hospice told me that his dogs, two great, big mastiffs, always let him know the moment anybody reached the top of the pass by their barking, the pass being nine hundred feet above the Hospice, up a steep slope of rocks and snow. Professor Heilprin and his companions were getting exceedingly cold, and were losing hope, when they were surprised by these dogs jumping on them, and

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<sup>43</sup> J. Stogdon. *The Late Accident on Mont Blanc. Alpine Journal, V.*

<sup>44</sup> *Alpine Journal, XV, 274.*







presently a man who had followed the dogs appeared with a lantern; they were all then able to descend in safety.

In an ascent I made some years ago, we were coming down a very narrow arête of rock, and were, fortunately, at the time very nearly off it. Below us was a long snow slope. We had reached our peak, the Portienhorn,<sup>45</sup> in very fine weather, but on the descent a storm had come across the valley from the north, and as it came up to us it began to thunder. When about fifty feet from the snow, we were enveloped in a heavy mist. Our ice axes suddenly began to give out a frightful hissing noise; they began to sing and to make a loud buzzing in our hands. There was a flash of lightning directly after that, but fortunately we were not struck. Parties have been struck in similar circumstances, the lightning being perhaps drawn to them by the steel of their axes.

This danger of getting lost through fogs and storms is one of the points that a climber should learn to guard against by training himself to remember the route that he has taken, in order to be able to retrace his steps. This faculty is generally absent in amateurs, but strongly developed in guides, though it is precisely one of those points that an amateur can do just as well as a guide. The power of retracing your steps is largely due to the habit of turning around constantly and taking a mental impression of your route *backwards* as you are coming up. I have not the least doubt that the habit of sketching largely increases a man's power in finding his route over again.

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<sup>45</sup> I made the second ascent of the highest peak of the Portienhorn (3,660 metres) and the first from the south on June 26, 1882, with Franz Burgener. We traversed the peak, ascending by the southern arête and descending by the northern arête.

The fascinations of a new ascent are quite beyond the appreciation of anyone who has not experienced them. You have your way to find; you have to keep watching out that no accident happens; you have the beauty of the scenery; all helping you along and inducing you sometimes to do things that you had much better leave undone. There are several Philadelphians who have added to our knowledge of the mountains; our President has been one of the explorers of Citlaltepēt̄l and Iztac̄íhuatl; my friend Mr. Binney was one of the party with whom I had the pleasure of first ascending and first naming the Piz Bevers in the Engadine. He also was the first English-speaking mountaineer to reach and give an account of the Hochalmspitze, the most Easterly glacier-bearing peak in Europe.<sup>46</sup> Mr. Charles Francis Judson, who is also a very excellent mountaineer, has, amongst other ascents, climbed the Grand Combin by a new route, an exceedingly brilliant piece of mountaineering.<sup>47</sup>

I think myself that possibly, without being realized by the climbers themselves, it is the beauty and the weirdness of the Alpine world, and the strange and always changing scenes that you experience on mountain trips, that induces so many persons to go through the difficulties and fatigues of climbing. Sunrise above the snow line, if you are once fairly up at eleven or twelve thousand feet, amongst fine peaks, is perhaps the most magnificent sight in the natural world. The view from the Gornergrat, if you have gotten up there before the sun rises, surrounded as you are by the Mischabel, the Lyskamm, the Weisshorn, and especially with the Matterhorn rising in its full majesty before you, is one of those views which

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<sup>46</sup> *Alpine Journal*, XII, 125.

<sup>47</sup> *Alpine Journal*, XV, 444.

transcend anything one could dream of. The Matterhorn glows before the sun rises with a most unearthly radiance, catching the reflection from the clouds, the air, and the sky, until long before you see the sun, the tip catches a faint flush of rosy gold which then descends the entire peak. Everything is gold in the lights and pale blue-gray in the shadows. Neither the Bay of Naples, nor anything I have seen on the ocean, nor in the flat countries, nor Niagara, seem to me to offer quite the grandeur that a fine mountain scene gives us. The most magnificent view I ever had was an hour and a half spent on the Ortler in the early morning of a cloudless day, before any snow clouds had arisen around the peaks. We were thirteen thousand feet up, in the highest spot in the Eastern Alps, with all our surroundings pale blue and shining silver, and from our summit could see all the Alps of Tyrol and all the Alps of Eastern Switzerland—the Dolomites, the Engadine, all their peaks revealed to us in hundreds and hundreds. Such a view amply repays one for the troubles and fatigues of many a long day's work, and I think anyone who has once looked upon such a scene can understand why men will brave the difficulties and dangers of mountaineering, and comprehend its fascinations.















